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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 26 1986

MEMORANDUM

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

TO: Robert Taylor, Product Manager
Fungicide/Herbicide Branch
Registration Division

SUBJECT: Metribuzin Ground-Water
Monitoring Study

The June, 1985 metribuzin registration standard states that a ground-water monitoring study will be required via an amendment to the standard. EAB/BUD provided us with the usage information this winter which is necessary for us to design a study. This study is one of the four "pilot projects" selected by Susan Sherman to test various strategies of imposing ground-water monitoring requirements on registrants.

Matt Lorber and I have discussed the proper study required and I have attached his guidance to the registrant. Basically, we are asking for two, parallel, stratified random surveys to be conducted in sugarcane and soybean areas in a few selected counties. The stratification variables (the way the potential study sites are characterized) are ground-water vulnerability and metribuzin usage.

Please pass this on to the registrant. I apologize for the delay, but we have been heavily involved cyanazine, and technical assistance to various EPA and state offices. Matt Lorber can be contacted for further information on 557-7358.

Matt Lorber for

Stuart Z. Cohen, Ph.D.
Ground-Water Team Leader
Exposure Assessment Branch
Hazard Evaluation Division, (TS-769C)

Attachment

cc: David J. Severn
Emil Regelman
Sam Creeger

Title. Design of Metribuzin Well Monitoring Program

The requirement for a ground water monitoring study was issued in the metribuzin standard which was published in June of 1985. The following is a brief description of key components of a monitoring program specifically for metribuzin which can serve as a guide in the development of a more detailed study plan. The registrants will be required to submit an initial study plan which will address the key components described in this summary. Subsequent discussions between the registrant and EPA will serve to refine the study plan and focus in more detail on the location of the wells to be sampled.

Objective. The objective of a monitoring program is usually stated in one paragraph. Nonetheless, it is a key ingredient as it dictates the design of the program, and results are measured against the program objective. Based on an analysis of metribuzin use, it was decided that the monitoring program will focus on two uses of metribuzin. One is the primary use of metribuzin, on soybeans, and the second is a minor use, on sugarcane. The latter use was chosen based on the knowledge of the hydrogeologic sensitivity of sugarcane growing regions, as well as a higher rate of application for sugarcane (1-3 lb ai/ac) as compared to soybeans (<1 lb ai/ac). In addition to a statement of the uses which will be monitored, an objective must also make a statement as to the resource which will be measured. Although the resource obviously is ground water in this case, the focus in this study will be rural domestic supply wells, and this should be stated in the objective. A final objective for the metribuzin monitoring study will be to focus efforts on hydrogeologically vulnerable areas. The purpose here is to look for metribuzin where it most likely would be, if it does leach and contaminate ground water. If there are little or no findings of metribuzin in wells in hydrogeologically vulnerable areas, then logically none would be expected to be found anywhere. On the other hand, no findings in hydrogeologically invulnerable areas still leaves the question as to contamination of ground water in vulnerable areas unanswered. In summary, the objective of this monitoring program is to estimate the extent of occurrence of metribuzin in rural domestic supply wells which are located in hydrogeologically vulnerable settings in the proximity of soybean and sugarcane fields with a history of metribuzin use.

Study Design. In order to meet this objective, the registrant will be required to conduct two parallel studies of soybean and sugarcane areas. These studies will consist of stratified, random, sampling.

A proposed study design addresses the following issues:

1) the final choice of "areas" to be sampled, and the rationale behind their selection,

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- 2) a description of the qualifications of a candidate well,
- 3) a proposed sampling schedule, and
- 4) other information as appropriate (quality assurance, etc.)

Typically, "areas", as outlined in an initial proposal, are counties. Two levels of stratification are suggested for use in locating these counties:

1) Metribuzin use: Heavy usage of metribuzin on the two crops can be described by either percent of land area treated or total pounds applied in the county. The attached map shows the percent of area treated by metribuzin. The source of this data is the Census of Agriculture's Doane data base for 1982. As can be seen, heavy soybean use is noted in Indiana, Illinois, Ohio, and Iowa, as well as southeast coastal soybeans in Georgia, and North and South Carolina. Small pockets of heavy sugarcane use are also noted in Louisiana and Mississippi.

2) Hydrogeologic vulnerability: Rating systems can be devised as part of the program, or an existing rating system can be used to characterize the average hydrogeologic vulnerability of a county. One rating system available is known as "DRASTIC", which ranks seven factors known to affect the contamination of ground water: D = depth to ground water, R = recharge, A = aquifer type, S = soil type, T = topography, I = impact of vadose zone, and C = aquifer conductivity. Assuming climate to be roughly similar over major soybean and sugarcane growing areas, the two most important factors which must be part of any ranking system are depth to ground water and top soil considerations.

The result of this county selection process will be, for example, 15 candidate soybean counties and 8 candidate sugarcane counties, all of which have high metribuzin use and high average vulnerability. The initial list of candidate soybean counties will include representatives from both the midwest and southeast coastal plain soybean growing areas. From these candidate lists, a subset of the counties, maybe 5 soybean and 2 sugarcane counties, will be selected (by some random process) for final sampling.

The selection of candidate wells will occur following an agreement on the selection of counties. A second level of hydrogeologic characterization on the sub-county level will allow for a clearer focus on areas of concern. Wells in these sensitive areas, along with others in outlying areas, can be located and included on a list of candidate wells.

Although the actual wells to be sampled will be decided in subsequent study design proposals, the initial proposal should address the issue of well suitability. The objective for well selection is to select those which tap shallow, first-encountered vulnerable aquifers. Wells which meet this criteria include rural drinking water wells, irrigation wells, USGS observation wells, and so on. Newly drilled wells for the purpose of the

survey would also be appropriate. Another major criteria for well selection is an acceptable degree of information about the well, which can be obtained from well drilling logs or some other documented knowledge of the well's history. Necessary information includes depth to well screen, grouting material, history of well usage, etc. Finally, usage of metribuzin in a soybean or sugarcane field nearby (and hopefully upgradient of the well) should be verifiable.

At least two rounds of sampling from the same wells is appropriate. Ideally, sampling should occur shortly after major periods of recharge (e.g., early summer after spring recharge).

These are the main ingredients for an initial monitoring program designed for metribuzin. Any additional information which would clarify study design should be included.

METRIBUZIN

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Pages _____ through _____ are not included.

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